

WHAT IS CLAIMED IS:

1. A method of selecting physical cylinders in a disc drive having at least one rotatable disc, the disc drive including a first head, which is positionable adjacent a first disc surface, and a second head, which is positionable adjacent a second disc surface, the first disc surface having a first plurality of greyscale tracks and the second disc surface having a second plurality of greyscale tracks, with each greyscale track of the second plurality of greyscale tracks corresponding to a different greyscale track of the first plurality of greyscale tracks, thereby forming a plurality of greyscale cylinders, wherein each greyscale cylinder of the plurality of greyscale cylinders comprising a pair of corresponding greyscale tracks, and wherein the physical cylinders are a subset of the plurality of the greyscale cylinders, the method comprising:

- (a) determining whether the first plurality of greyscale tracks or the second plurality of greyscale tracks demonstrates greater track eccentricity, to thereby obtain a maximum track eccentricity surface and a corresponding maximum eccentricity head, the maximum track eccentricity surface being one of the first and second disc surfaces and the maximum eccentricity head being a corresponding one of the first and second heads; and
- (b) utilizing the maximum eccentricity head to locate at least one of the physical cylinders.

2. The method of claim 1 wherein the utilizing step (b) further comprises selecting, using the maximum eccentricity head, a greyscale cylinder of the plurality of greyscale cylinders, for use as a first physical cylinder, the first physical cylinder being most proximate a disc outer diameter of the physical cylinders.

3. The method of claim 2 wherein selecting, using the maximum eccentricity head, the greycode cylinder of the plurality of greycode cylinders, for use as the first physical cylinder further comprises seeking, using the maximum eccentricity head, in a direction of the disc outer diameter until an outer diameter crash stop is encountered, to thereby locate an outer diameter crash stop greycode cylinder of the plurality of greycode cylinders, and utilizing the outer diameter crash stop greycode cylinder to select the first physical cylinder.

4. The method of claim 3 further comprising selecting the first physical cylinder by adding margin cylinders to the located outer diameter crash stop greycode cylinder in a direction away from the disc outer diameter.

5. The method of claim 4 further comprising computing a difference between a greycode cylinder number corresponding to a first greycode cylinder and a greycode cylinder number corresponding to the first physical cylinder to obtain a maximum eccentricity physical cylinder offset, the first greycode cylinder being most proximate the disc outer diameter of the plurality of greycode cylinders.

6. The method of claim 5 further comprising seeking, using the maximum eccentricity head, an arbitrary cylinder of the plurality of greycode cylinders, the arbitrary cylinder being either a first physical cylinder or a greycode cylinder less proximate the disc outer diameter than the first physical cylinder, and computing a difference between a greycode cylinder number corresponding to the arbitrary cylinder and a greycode cylinder number corresponding to a greycode track under a remaining head, when the maximum eccentricity head is over a greycode track of the arbitrary cylinder, to obtain a head offset, the remaining head being one of the first and second heads other than the maximum eccentricity head.

7. The method of claim 6 further comprising adding the head offset to the maximum eccentricity physical cylinder offset to obtain a physical cylinder offset corresponding to the remaining head.
8. The method of claim 7 further comprising storing the maximum eccentricity physical cylinder offset and the physical cylinder offset corresponding to the remaining head.
9. The method of claim 1 wherein the utilizing step (b) further comprises seeking, using the maximum eccentricity head, an arbitrary cylinder of the plurality of greycode cylinders, the arbitrary cylinder being either a first physical cylinder or a greycode cylinder less proximate the disc outer diameter than the first physical cylinder, and computing a difference between a greycode cylinder number corresponding to the arbitrary cylinder and a greycode cylinder number corresponding to a greycode track under a remaining head, when the maximum eccentricity head is over a greycode track of the arbitrary cylinder, to obtain a head offset, the remaining head being one of the first and second heads other than the maximum eccentricity head.
10. The method of claim 9 further comprising determining, based on the greycode cylinder number corresponding to the arbitrary cylinder and the greycode cylinder number corresponding to the greycode track under the remaining head, whether the maximum eccentricity head or the remaining head is more proximate a disc outer diameter ramp.
11. The method of claim 10 further comprising selecting the head that is more proximate the disc outer diameter ramp for use as a reference head for adjusting for the head offset during head switch operations.

12. The method of claim 4 further comprising determining whether the added margin cylinders exceed a predefined margin cylinder limit, and recording an exceeded cylinder amount if the added margin cylinders are determined to exceed the predefined margin limit.
13. The method of claim 12 further comprising performing, if the exceeded cylinder amount is greater than zero, defect analysis of the physical cylinders to determine a number of unused spare cylinders of the physical cylinders.
14. The method of claim 13 further comprising classifying the disc drive as failed if the number of unused spare cylinders is less than the exceeded cylinder amount.
15. The method of claim 13 further comprising subtracting the exceed cylinder amount from a number of the physical cylinders to obtain a new number of physical cylinders if the number of unused spare cylinders is greater than or equal to the exceeded cylinder amount.
16. The method of claim 15 further comprising adjusting a location of a last physical cylinder based on the new number of physical cylinders.
17. A disc drive comprising:
  - at least one rotatable disc;
  - a first head positionable adjacent a first disc surface, the first disc surface having a first plurality of greyscale tracks;
  - a second head positionable adjacent a second disc surface, the second disc surface having a second plurality of greyscale tracks, with each greyscale track of the second plurality of greyscale tracks corresponding to a different greyscale track of the first plurality of

greyscale tracks, thereby forming a plurality of greyscale cylinders, wherein each greyscale cylinder of the plurality of greyscale cylinders comprising a pair of corresponding greyscale tracks; and a physical cylinder selection module configured to select physical cylinders from the plurality of greyscale cylinders by:

- (a) determining whether the first plurality of greyscale tracks or the second plurality of greyscale tracks demonstrates greater track eccentricity, to thereby obtain a maximum track eccentricity surface and a corresponding maximum eccentricity head, the maximum track eccentricity surface being one of the first and second disc surfaces and the maximum eccentricity head being a corresponding one of the first and second heads; and
- (b) utilizing the maximum eccentricity head to locate at least one of the physical cylinders.

18. The apparatus of claim 17 wherein the physical cylinder selection module is further configured to carry out the utilizing step (b) by selecting, using the maximum eccentricity head, a greyscale cylinder of the plurality of greyscale cylinders, for use as a first physical cylinder, the first physical cylinder being most proximate a disc outer diameter of the physical cylinders.

19. The apparatus of claim 18 wherein the physical cylinder selection module is further configured to select, using the maximum eccentricity head, the greyscale cylinder of the plurality of greyscale cylinders, for use as the first physical cylinder by seeking, using the maximum eccentricity head, in a direction of the disc outer diameter until an outer diameter crash stop is encountered, to thereby locate an outer diameter crash stop greyscale cylinder of the plurality of greyscale

cylinders, and utilizing the outer diameter crash stop greyscale cylinder to select the first physical cylinder.

20. The apparatus of claim 19 wherein the physical cylinder selection module is further configured to select the first physical cylinder by adding margin cylinders to the located outer diameter crash stop greyscale cylinder in a direction away from the disc outer diameter.

21. The apparatus of claim 20 wherein the physical cylinder selection module is further configured to compute a difference between a greyscale cylinder number corresponding to a first greyscale cylinder and a greyscale cylinder number corresponding to the first physical cylinder to obtain a maximum eccentricity physical cylinder offset, the first greyscale cylinder being most proximate the disc outer diameter of the plurality of greyscale cylinders.

22. The apparatus of claim 21 wherein the physical cylinder selection module is further configured to seek, using the maximum eccentricity head, an arbitrary cylinder of the plurality of greyscale cylinders, the arbitrary cylinder being either the first physical cylinder or a greyscale cylinder less proximate the disc outer diameter than the first physical cylinder, and to compute a difference between a greyscale cylinder number corresponding to the arbitrary cylinder and a greyscale cylinder number corresponding to a greyscale track under a remaining head, when the maximum eccentricity head is over a greyscale track of the arbitrary cylinder, to obtain a head offset, the remaining head being one of the first and second heads other than the maximum eccentricity head.

23. The apparatus of claim 22 wherein the physical cylinder selection module is further configured to add the head offset to the maximum eccentricity physical

cylinder offset to obtain a physical cylinder offset corresponding to the remaining head.

24. The apparatus of claim 23 wherein the physical cylinder selection module is further configured to store the maximum eccentricity physical cylinder offset and the physical cylinder offset corresponding to the remaining head.

25. The apparatus of claim 17 wherein the physical cylinder selection module is further configured to carry out the utilizing step (b) by seeking, using the maximum eccentricity head, an arbitrary cylinder of the plurality of greyscale cylinders, the arbitrary cylinder being either the first physical cylinder or a greyscale cylinder less proximate the disc outer diameter than the first physical cylinder, and computing a difference between a greyscale cylinder number corresponding to the arbitrary cylinder and a greyscale cylinder number corresponding to a greyscale track under a remaining head, when the maximum eccentricity head is over a greyscale track of the arbitrary cylinder, to obtain a head offset, the remaining head being one of the first and second heads other than the maximum eccentricity head.

26. The apparatus of claim 25 wherein the physical cylinder selection module is further configured to determine, based on the greyscale cylinder number corresponding to the arbitrary cylinder and the greyscale cylinder number corresponding to the greyscale track under the remaining head, whether the maximum eccentricity head or the remaining head is more proximate a disc outer diameter ramp.

27. The apparatus of claim 26 wherein the physical cylinder selection module is further configured to select the head that is more proximate the disc outer

diameter ramp for use as a reference head for adjusting for the head offset during head switch operations.

28. The apparatus of claim 20 wherein the physical cylinder selection module is further configured to determine whether the added margin cylinders exceed a predefined margin cylinder limit, and to record an exceeded cylinder amount if the added margin cylinders are determined to exceed the predefined margin limit.

29. The apparatus of claim 28 wherein the physical cylinder selection module is further configured to perform, if the exceeded cylinder amount is greater than zero, defect analysis on the physical cylinders to determine a number of unused spare cylinders of the physical cylinders.

30. The apparatus of claim 29 wherein the physical cylinder selection module is further configured to classify the disc drive as failed if the number of unused spare cylinders is less than the exceeded cylinder amount.

31. The apparatus of claim 30 wherein the physical cylinder selection module is further configured to subtract the exceed cylinder amount from a number of the physical cylinders to obtain a new number of physical cylinders if the number of unused spare cylinders is greater than or equal to the exceeded cylinder amount.

32. The apparatus of claim 31 wherein the physical cylinder selection module is further configured to adjust a location of a last physical cylinder based on the new number of physical cylinders.

33. A method of selecting physical tracks in a disc drive having a rotatable disc, the disc drive including a head that is positionable adjacent a disc surface, the disc surface having a plurality of greyscale tracks from which the physical



tracks are selected, the physical tracks are a subset of the greyscale tracks, the method comprising:

- (a) seeking, using the head, in a direction of a disc outer diameter until an outer diameter crash stop is encountered, to thereby locate an outer diameter crash stop greyscale track of the plurality of greyscale tracks; and
- (b) utilizing the outer diameter crash stop greyscale track to select a first physical track, the first physical track being most proximate the disc outer diameter of the physical tracks.

34. The method of claim 33 further comprising selecting the first physical track by adding margin tracks to the located outer diameter crash stop greyscale track in a direction away from the disc outer diameter.

35. The method of claim 34 further comprising determining whether the added margin tracks exceed a predefined margin track limit, and recording an exceeded track amount if the added margin tracks are determined to exceed the predefined margin limit.

36. The method of claim 35 further comprising performing, if the exceeded track amount is greater than zero, defect analysis of the physical tracks to determine a number of unused spare tracks of the physical tracks.

37. The method of claim 36 further comprising classifying the disc drive as failed if the number of unused spare tracks is less than the exceeded track amount.

38. The method of claim 36 further comprising subtracting the exceed track amount from a number of the physical tracks to obtain a new number of physical

tracks if the number of unused spare tracks is greater than or equal to the exceeded track amount.

39. The method of claim 38 further comprising adjusting a location of a last physical track based on the new number of physical tracks.

40. A method of selecting physical cylinders in a disc drive having at least one rotatable disc, the disc drive including a first head, which is positionable adjacent a first disc surface, and a second head, which is positionable adjacent a second disc surface, the first disc surface having a first plurality of greyscale tracks and the second disc surface having a second plurality of greyscale tracks, with each greyscale track of the second plurality of greyscale tracks corresponding to a different greyscale track of the first plurality of greyscale tracks, thereby forming a plurality of greyscale cylinders, wherein each greyscale cylinder of the plurality of greyscale cylinders comprising a pair of corresponding greyscale tracks, and wherein the physical cylinders are a subset of the plurality of the greyscale cylinders, the method comprising:

- (a) selecting one of the first and second heads as a reference head; and
- (b) utilizing the reference head to locate at least one of the physical cylinders.

41. The method of claim 40 wherein the utilizing step (b) further comprises seeking, using the reference head, an arbitrary cylinder of the plurality of greyscale cylinders, and computing a difference between a greyscale cylinder number corresponding to the arbitrary cylinder and a greyscale cylinder number corresponding to a greyscale track under a remaining head, when the reference head is over a greyscale track of the arbitrary cylinder, to obtain a head offset, the remaining head being one of the first and second heads other than the reference head.

42. A disc drive comprising:  
a plurality of greyscale cylinders;  
means for selecting physical cylinders from the plurality of greyscale cylinders.